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AUTHOR Perry, Raymond P.: And Others
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ABSTRACT

Observational learning is an extremely efficient, rapid training technique for the acquisition of complex behavior patterns in social situation. A modified observational learning (MOL) procedure was developed combining both modeling and microteaching techniques, with the observer serving as the model. The more similar the observer is to the model, the easier it should be for the observer to incorporate the new set of responses. The MOL model's most important modification to microteaching is that it does not exhibit inappropriate teaching behaviors, since negative models are less effective than positive models. This experiment investigated the MOL procedure in which it was predicted that students would rate MOL-trained lecturers as more effective teachers and learn more from them. Graduate students lectured to undergraduate students, who then rated each lecturer's teaching effectiveness and wrote a multiple-choice examination. Following pretesting two graduate student trainees received instruction in effective MOL teaching, while two controls received no instruction. Trainees and controls again lectured, after which students rated them and wrote the exam. Pretesting results indicated no significant differences between trainees and controls on student ratings and achievement. Posttest results showed a treatment by lecturer interaction in which the lecturer being more effective at pretesting derived most benefit from MOL training. These results suggest that individual differences may be an important consideration when developing teacher-training procedures. (Author/MSE)

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AN OBSERVATIONAL LEARNING PROCEDURE FOR IMPROVING UNIVERSITY INSTRUCTION

Raymond P. Perry Les Leventhal
University of Manitoba

Philip C. Abrami
McGill University

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Microteaching, a recent innovation in teacher-training programs, is designed to equip the prospective teacher with skills that enhance a student's learning experience. It can be conceptualized as an observational learning paradigm (Bandura, 1969), since it attempts to facilitate the acquisition of effective teaching behaviors via modeling principles (e.g., Borg, 1972). A modified observational learning (MOL) procedure was developed for present research pruposes combining procedures from both observational learning and microteaching. The majcr modification to observational learning procedures was to have the observer serve as the model. All other things being equal, it would seem that the more similar the observer is to the model, the easier it would be for the observer to incorporate the new set of responses into his/her existing behavior repertoire. Additional modifications included a cognitive discrimination paradigm to accentuate the appropriate aclass of responses by juxtaposing the target behaviors with inappropriate behaviors (Wagner, 1973). Massed observational practise, where the observer reviews the target behaviors, was derived from the verbal learning literature in which acquisition is facilitated through active rehersal.

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The MOL procedure included modifications to microteaching techniques, the most important being that the model does not exhibit inappropriate teaching behaviors. Under normal circumstances a trainee's first presentation, which typically involves a number of inappropriate teaching behaviors, is videotaped and replayed. Consequently, many undesirable behaviors are introduced and possibly strengthened. Bandura (1969) has argued that positive exemplary models are not essential since negative models who exhibit undesirable behaviors that result

in aversive consequences cause observers not to imitate those responses. Negative models are considered to be less effective than positive models since they focus attention on inappropriate responding and do not provide the necessary cues for the appropriate behaviors.

Recently, some researchers (e.g., Cronbach & Snow, 1975) have stressed the importance of individual differences in educational programs. Individual differences may also be important for teacher-training programs. Pambookian (1974) divided college instructors into three teaching ability categories according to student ratings made early in the semester: poor, average, and good. All instructors were given detailed feedback about their evaluations and retested at term-end. Results showed greatest improvement occurred for the average and good instructors, with least change by the poor instructors. Poor instructors changed least, it was argued, because high anxiety produced by negative feedback leads to rigidity in behavior. For the present experiment these results suggested that training programs may interact with instructor characteristics.

Method

The subjects were 187 introductory psychology students at the University of Manitoba who served as "students" during the lecture presentations. Ninety subjects were randomly assigned to four pretraining conditions (N = 19, 20, 24, 27), and 97 were assigned to the four posttraining conditions (N = 20, 22, 22, 33).

The materials included a videotape recording system for the MOL training and a questionnaire for assessing teaching effectiveness. The questionnaire contained two single-item student rating measures and a student achievement measure. The student rating measures assessed the overall value of the lecture and the instructor's general teaching ability. The achievement measure was a multiple-choice test having two subscales. Achievement 1 was composed of ten items which were taken from an entrance examination at the University of Manitoba designed to assess

a student's competence in chemistry. Achievement 2 was constructed by the experimenter and consisted of five items related to content covered in the lecture material.

Lecturer selection and pretraining phase. Two lecturer-trainees and two control graduate students were interviewed to ensure background expertise in the lecture topic was comparable. The 90 psychology subjects were assigned to one of the four lecturers to serve as "students". Following the presentation the lecturer was asked to leave. The students rated the lecturer and took the multiple-choice test.

Training phase. In order to implement the MOL program it was necessary to construct a master tape which would depict the trainee exhibiting the component sequences of the complex behavior (effective teaching). Thus, the observer served as his/her own model using the master tape. The Michigan University student rating questionnaire (McKeachie, Lin & Mann, 1971) was used to identify those teaching behaviors which appear related to effective instruction. From seven dimensions, four were selected as appropriate for the short presentation limitations of the experimental conditions and role-playing sketches for each dimension were developed in consultation with the trainee and three judges who were researchers in teaching effectiveness. As the trainee role-played, the three judges observed the sketch and then rated in on a 10-point sclae. If the three judges rated the sketch as being portrayed "very well" ($\bar{X} \geq 8$), the sketch was considered a "take" and was transferred to the trainee's master tape. If $\bar{X} < 8.00$, the trainee was informed and was given specific feedback for improving the portrayal of the sketch. This procedure was repeated until sketches for all four teaching behaviors were transferred to a master tape for each trainee.

Following taping the trainee received a master tape which contained the four role sketches and the pretraining lecture presentation. The master tape ensured that the trainee (observer) acted as his/her own model exhibiting four effective teaching behaviors; and that cognitive discrimination (Wagner, 1973) occurred by contrasting the effective teaching behaviors with the pretraining presentation.

The trainees were asked to spend 3½ hours each week observing the master tape.

Posttraining phase. Procedurally, this phase was almost identical to the pretraining phase except that four new groups of students (N = 97) were used. Following the lecture the students rated the lecturer and wrote the multiple-choice test.

Results

Pretraining teaching effectiveness was assessed using four measures: value of the lecture; general teaching ability; achievement 1; achievement 2. Group means and standard deviations are presented in Table 1.

Comparisons between MOL lecturers and control lecturers indicated that at pretraining between group differences did not exist and within group differences occurred in both experimental groups. Based on these pretraining scores, each lecturer within the MOL and control groups was assigned to either a "low" or an "high" teaching effectiveness condition. The lecturer having the lower values on each of the four dependent variables was classified as low, and the other as high. For the two student ratings measures, the means were significantly different between the low and high lecturers in both MOL and control conditions. For the two student achievement measures the means, while not significant, were consistent with the ratings, the one reversal occurring in the control condition on achievement 1 (see Table 1). This classification procedure yielded a training (MOL/control) by lecturer effectiveness (low/high) factorial design.

The unit of analysis in this 2 x 2 factorial design was the student. The mean for each experimental condition is based on one lecturer, and is computed by averaging n student raw scores for that lecturer. Treatment effects, therefore, are confounded with the lecturer. The lecturer was not the unit of analysis in the present experiment due to recruitment difficulties and logistical limitations. All lecturers were graduate students enrolled in a full program of studies who

received no academic credit for experimental participation. Posttraining teaching effectiveness was assessed using a two (training) by two (lecturer effectiveness) ANOVA for each of the dependent variables. Group means and standard deviations are presented in Table 1. Training (MOL/control) had a significant effect on all dependent measures, and lecturer effectiveness (low/high) had an effect only on lecture value. These main effects were modified by a training by lecturer effectiveness interaction on three of the four dependent measures. The interaction was analyzed for the three dependent measures. Between training group comparisons indicated that, for high effective lecturers, MOL training produced more favorable student ratings than no training (control) on teaching ability, and on lecture value, and produced greater student achievement (2). For low effective lecturers, MOL training yielded less favorable ratings than no training (control) on lecture value, and no differences on teaching ability, and on student achievement. Thus, the teaching ability, lecture value and achievement (2) results indicated that MOL training was successful for initially high effective lecturers only. Low effective lecturers receiving MOL training produced no improvement in ratings or achievement over untrained (control) lecturers.

Posttraining comparisons revealed significant differences favoring MOL training that did not exist at pretraining. Specifically, the high effective trainee received better ratings and produeced greater achievement. To determine how performance changed over time, the pre and posttraining scores for each lecturer were compared for the three dependent variables having interaction effects. In the MOL condition the low effective lecture showed no change in ratings or achievement scores from pre to posttraining. For the high effective lecturer student ratings decreased from pre to posttraining for lecture value, and for teaching ability. No chages occurred for student achievement.

Discussion

The purpose of this experiment was to deterime whether MOL training improved

teaching effectiveness for lecturers who differ in pretraining teaching ability. The results showed that MOL training interacted with lecturer differences. For initially low effective lecturers MOL training compared to no training revealed no differences in student ratings and achievement. For initially high effective lecturers MOL training compared to no training indicated higher student ratings and achievement favoring the MOL lecturer. Thus, MOL training does not appear to be equally successful for all lecturers.

The low effective lecturer's poor performance suggests that MOL training may not be appropriate for improving teaching effectiveness for low effective instructors. Such a conclusion is premature, however and may have disastrous implications for educational programs since it eliminates from training those instructors who need training most. An alternative implication is that other factors may be interfering with MOL training for low effective lecturers. For example, one possible factor may be lecturer anxiety. This line of reasoning receives some support from Coates and Toresen's review (1976) of factors contributing to teacher anxiety. They found anxiety to be a significant problem for both beginning and experienced teachers, with microteaching representing a frequent source of anxiety for the beginning teacher. These results emphasize the importance of individual differences in teacher-training programs, i.e., aptitude-treatment interactions.

Although MOL training improved teaching effectiveness for the high effective lecturer, the present data do not permit us to determine which specific variables influenced the outcomes. Cognitive discrimination, massed practice, and role-playing may have been responsible for the outcomes singly, or in combination. It is not likely that role-playing per se had a major effect, since it was a one-shot training session which lasted less than an hour. It is more likely that cognitive discrimination and massed practice contributed to the outcome, since both have been shown to facilitate response acquisition in other contexts. These changes, however, were considered as improvements to existing modeling and mirco-teaching techniques and are an integral part of MOL training.

Caution should be exercised when interpreting these results since problems may exist due to the small number of lecturers and the use of novice teachers. Having one lecturer per experimental condition requires that the student be used as the unit of analysis. This procedure can threaten the internal validity of the experiment. That is, teaching improvements attributed to a training effect may simply be due to idiosyncratic lecturer differences which were not controlled. The lack of differences between lecturers on pretraining measures and the lack of differences between the control lecturers on posttraining measures, suggests comparability between lecturers at pretraining, and between controls at post-training. Consequently, these lecturer differences appear less likely to be responsible for producing the posttraining differences.

Exteranl validity is a more severe problem since the results may be lecturer-specific. Generalizing beyond the experimental setting to other lecturers would be inappropriate. This problem cannot be resolved here since the solution is to use the lecturer as the unit of analysis by assigning a large number of lecturers to each experimental condition. External validity may also be a problem if the results are generalized to all teaching improvement programs. The present experiment used novice lecturers and the results may have less applicability to those programs involving practising teachers. The MOL procedure's success in improving fundamental teaching skills may not be adequate for training experienced teachers in complex teaching behaviors.

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Table 1[a]

Pre/post student ratings and student achievement means and standard deviations.

	Pretraining				Post-training			
	T_l	T_h	C_l	C_h	T_l	T_h	C_l	C_h
Lecture Value $\bar{X}$	4.54	3.00	4.04	3.16	4.40	2.68	3.91	3.76
SD	0.88	0.92	0.85	0.83	0.82	0.57	0.68	0.79
Teaching Ability $\bar{X}$	4.71	2.90	4.10	2.95	4.45	2.64	4.14	3.42
SD	0.55	0.79	0.62	0.52	0.76	0.79	0.71	0.97
Achievement 1 $\bar{X}$	2.96	3.10	2.93	1.68	2.90	3.77	2.59	2.27
SD	2.39	1.97	1.96	1.06	1.59	2.05	1.40	1.64
Achievement 2 $\bar{X}$	2.63	2.90	2.89	2.95	2.90	3.82	2.41	2.73
SD	1.81	1.37	1.45	1.43	1.37	1.14	1.62	1.40
n	24	20	27	19	20	22	22	33

[a]for lecture value and teaching ability, a lower score implies more favorable ratings. For achievement 1 and 2, a higher score implies greater achievement.

T_l = low effective trainee

T_h = high effective trainee

C_l = low effective control

C_h = high effective control